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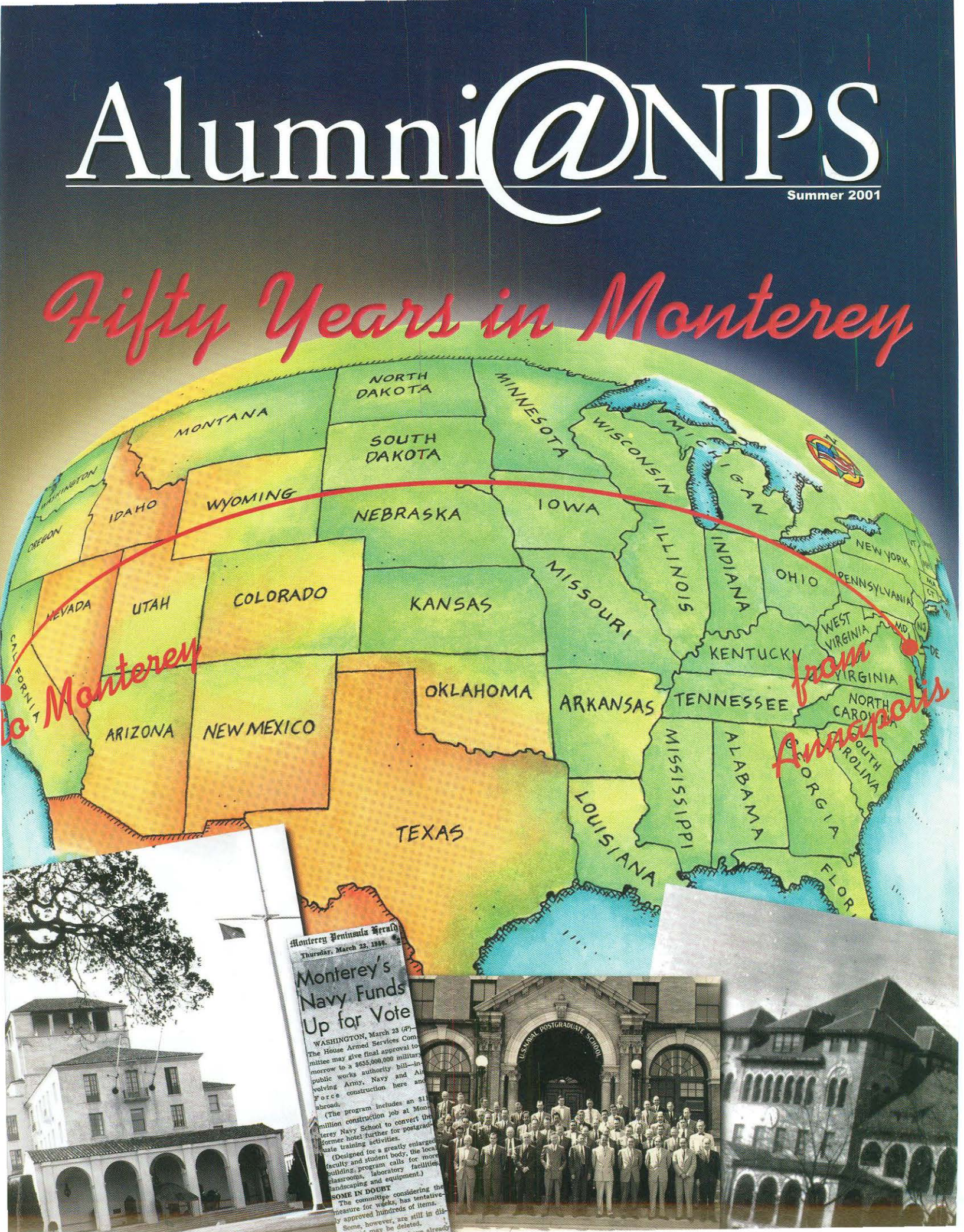
Fifty Years in Monterey



Monterey Peninsula Herald
Thursday, March 23, 1944

Monterey's Navy Funds Up for Vote

WASHINGTON, March 23 (AP)—The House Armed Services Committee may give final approval tomorrow to a $655,000,000 military public works authority bill—involving Army, Navy and Air Force construction here and abroad.

(The program includes an $11 million construction job at Monterey Navy School to convert the former hotel further for postgraduate training activities.

(Designed for a greatly enlarged faculty and student body, the local building program calls for more classrooms, laboratory facilities, landscaping and equipment.)

SOME IN DOUBT

The committee considering the measure for weeks, has tentatively approved hundreds of items. Some, however, are still in dis-

From An to

by John Sanders

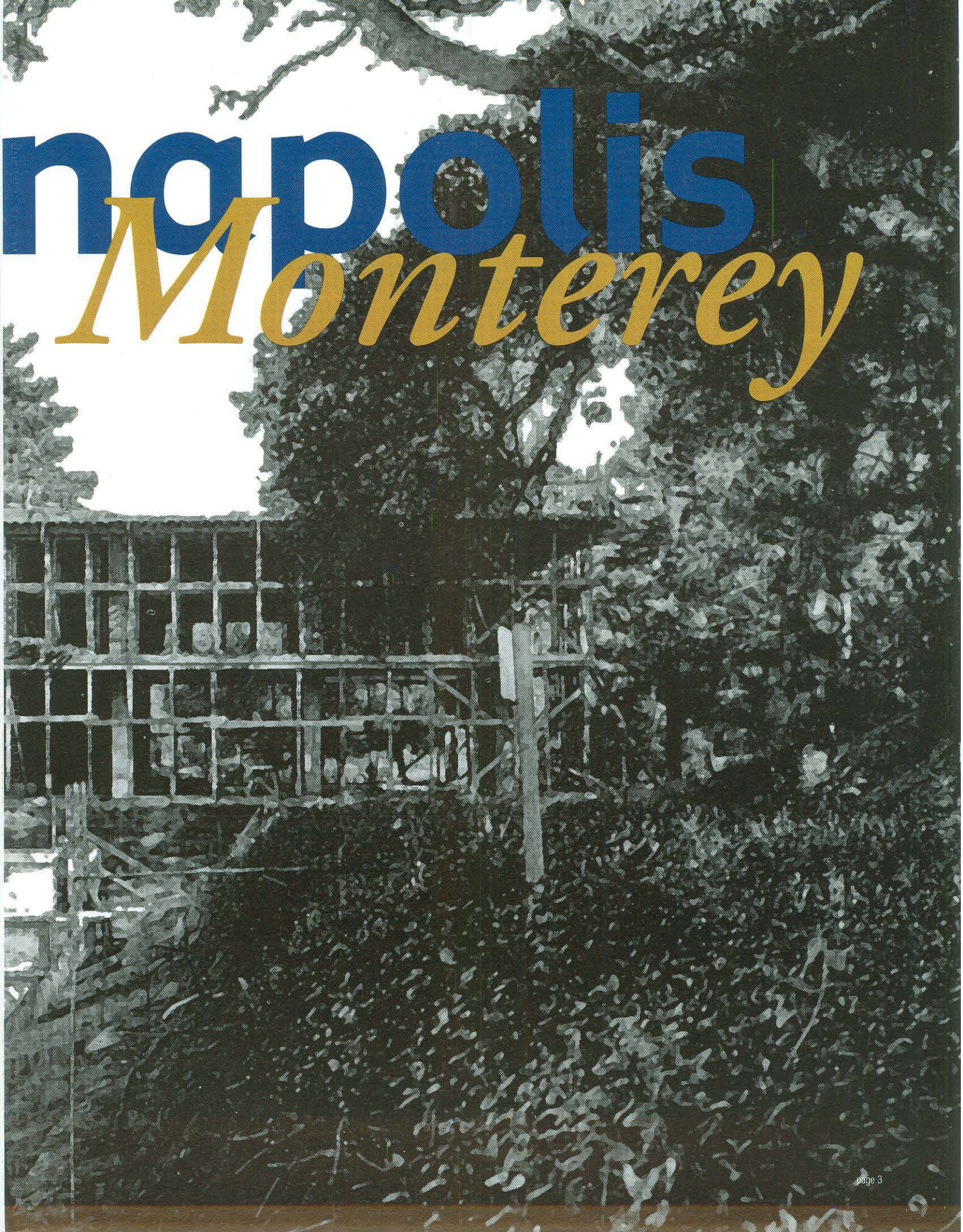
When Abe Sheingold joined the Naval Postgraduate School faculty in 1946, the rumors were already circulating: The school would not stay in Annapolis for much longer.

"The destination was not apparent," Sheingold said, but new faculty "came with the thought the school would be moving."

It would be more than a year before the Navy would identify the future site for NPS, and five rollercoaster years of uncertainty before the school would leave Annapolis for Monterey.

Sheingold had spent the war years as an instructor in the Massachusetts Institute of Technology Radar School, a program that had been established in 1941 to provide education on the principles and techniques of ultra-shortwave and microwave radar for a select group of Navy and Army officers.

In the decade prior to World War II, enrollments at NPS varied from a low of 94 in 1932 to a high of 136 in 1940. With the outbreak of war, the Navy established several advanced technical short courses to accompany the existing programs. NPS enrollment jumped to more than 400 in 1942, and continued to climb to more than 700 by 1944.


napolis
Monterey

From Annapolis *to Monterey*

When Sheingold arrived on campus, the facilities were severely strained. Seven professors shared an open, "bullpen" style office. The portico of Halligan Hall, the sole building occupied by NPS at Annapolis, would soon be enclosed to provide additional laboratory space.

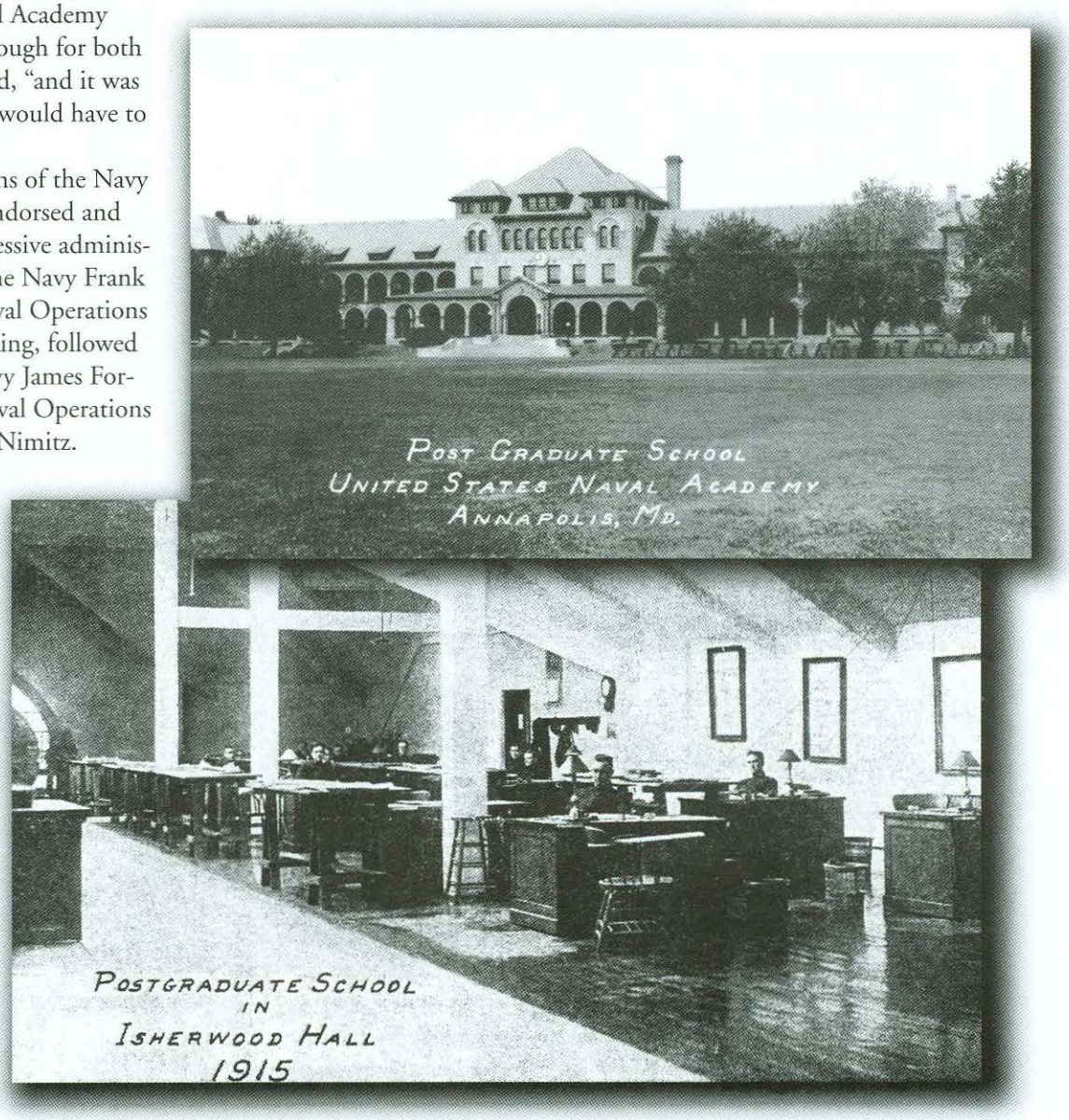
In addition, three Navy boards -- two in 1944 and the third in 1945 -- had recommended further expansion of postgraduate education programs. Put simply, "The Naval Academy campus wasn't large enough for both schools," Sheingold said, "and it was clear which of the two would have to move."

The recommendations of the Navy boards were strongly endorsed and supported by two successive administrations: Secretary of the Navy Frank Knox and Chief of Naval Operations Fleet Admiral Ernest King, followed by Secretary of the Navy James Forrestal, and Chief of Naval Operations Fleet Admiral Chester Nimitz.

In May 1947, the Navy announced selection of Monterey's Hotel Del Monte as the site for a new NPS campus and, in July, the 80th Congress passed Public Law No. 302, authorizing the Secretary of the Navy to establish a postgraduate school in Monterey.

Still, the future seemed just as uncertain as it had been when Sheingold first arrived. Nearly a year would lapse before the appropriations bill was finalized and signed by President Harry S. Truman on May 11, 1948. And even as the Navy presented a check for $2,149,800 to Sam Morse, president of Del Monte Properties Company (the forerunner of today's Pebble Beach Company), opponents were mounting forces to kill future appropriations that would pay for the move and campus construction.

NPS Superintendent Rear Adm. Herman Spanagel, who served an



unprecedented six-year term from 1944-1950, made frequent appearances before Congressional subcommittees on Capitol Hill. But funding measures for the relocation never even made it to the House floor.

As Rear Adm. Ernest E. Herrmann took the reins as Superintendent and continued to push for the necessary appropriations, public rancor over the move reached the boiling point. The *Annapolis Evening Capitol* published a page one editorial on March 13, 1951 stating: "This newspaper differs with the wishes of the Navy... we at all times deplore reckless spending, and we consider that the construction of new buildings in California to house a Navy engineering school and laboratory constitutes a waste of public funds."

The editorial drew fire from NPS faculty, students, and spouses. In subsequent letters to the editor, mathematics Prof. Francis Pulliam said: "The overcrowded conditions at the school give the teachers and students alike no quiet for their preparations and research and makes many projects impossible."

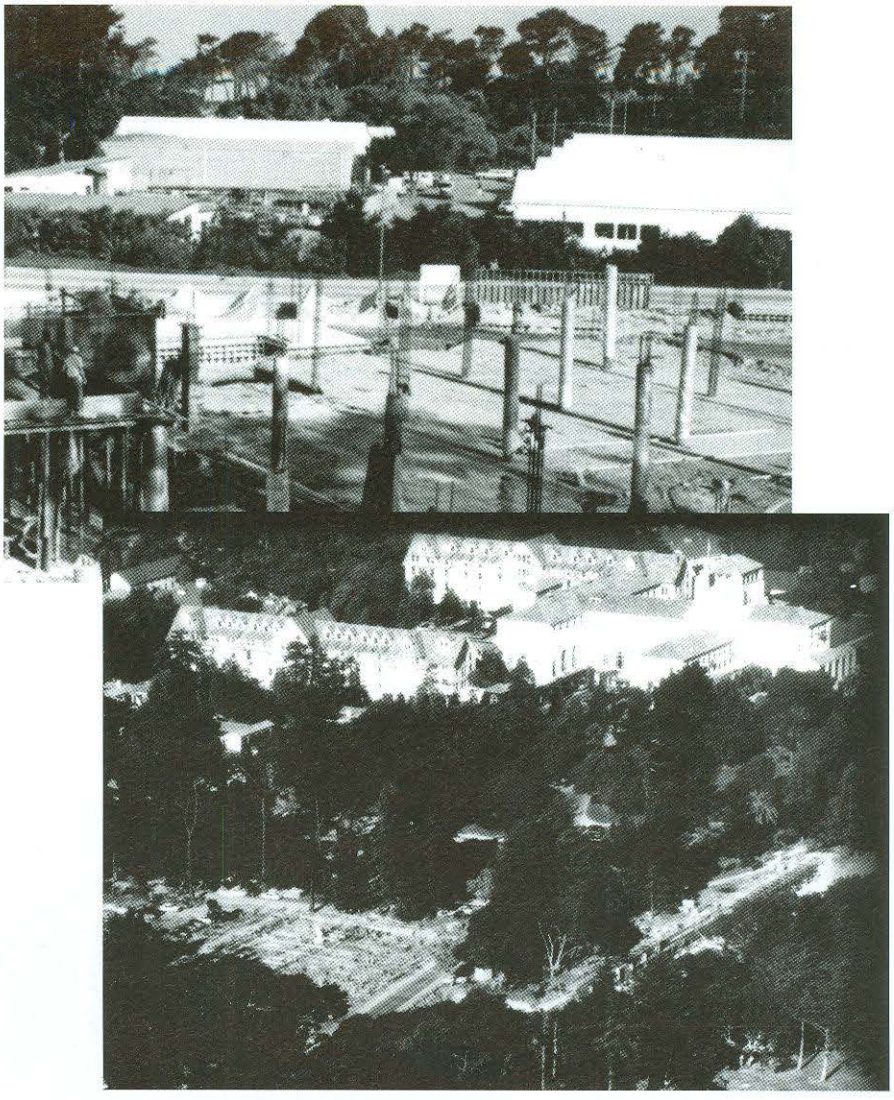
Married students were housed in tin Quonset, or Homoja, huts, with two families sharing a single hut. The *Evening Capitol* labeled the facilities adequate. Navy wife Elaine Laessle differed. "In our hut, the children use the two slanting-ceiling bedrooms, the kitchen is 'standing room only,' and the living room serves as hallway, playroom, dining room, study for my husband, as well as bedroom for us grownups. I herewith cordially invite the *Evening Capitol* to inspect my home... please stagger your visits to two people at a time because we are so crowded."

Herrmann, who had already been engaged in marathon meetings with local government and business leaders for months before the *Evening Capitol's* explosive editorial, capitalized on the outburst. The pace and intensity of negotiations increased, and the Admiral established a truce. Before leaving Annapolis in December, he would tell reporters, "It is to the great and lasting credit of Annapolis that after the 'cease fire' of last March 26th, Annapolis has looked upon our departure with kindness and wished us well."

He and Academic Dean Roy S. Glasgow then adjusted the academic calendar so that the final session of 1951 could end prior to Thanksgiving in order that the move could

PROFESSORIAL STAFF
1950-51

From Annapolis to Monterey



(Top) In 1969, construction began on the Naval Postgraduate School's Dudley Knox Library which now houses over a million scientific volumes and periodicals.

(Bottom) Activity flourishes as construction on the academic buildings is underway. In the background of this 1951 aerial view of the new Naval Postgraduate School grounds, the tell-tale main administration building, Herrmann Hall, stands overlooking the operation.

begin before winter had a firm grip on Annapolis. Still, there was no funding from the military public works appropriations bill to pay for the move, and many were surprised when Herrmann announced in late October that the move was definitely on.

One of the school's most senior faculty members, Prof. Carl E. Menneken, was among them. "The Mennekens ironically had come to the conclusion that the school would never move, and had just built a new house," Sheingold observed.

Menneken, an electronics professor, and his wife Jessie, made the difficult decision to put their home on a stagnant real estate market and move with the school. Faculty retention was a major concern to Herrmann and Glasgow as they planned the school's move, Sheingold said, and he especially credits Glasgow with adroit handling of faculty issues. Retaining Menneken would turn out to have a major impact on future operations at NPS for, in 1962, he became the school's first dean of research and was instrumental in establishing formal research programs for all NPS faculty. In the 1980's, his wife Jessie created an endowment with the Naval Postgraduate School Foundation to provide monetary awards for outstanding defense-related research by junior NPS professors.

As the session ended on Nov. 21, nearly 500 NPS personnel -- 370 students, 25 military staff, 65 faculty, and 25 civilian staff -- prepared for the cross-country move to Monterey. Technicians disassembled radars and two wind tunnels and loaded them into boxcars along with heavy machinery, lab test equipment, boilers, office furniture, and thousands of books. In an operation that rivaled the logistical challenges of a World War II battle theater, NPS shipped approximately three million pounds of gear by railroad, trucking companies, ships, and aircraft.

Sheingold and his wife, Sylvia, packed up their two-bedroom apartment for shippers and prepared their 1950 Dodge four-door sedan for the cross-country trip with their two small children. Winter weather did not adversely affect their travels until they reached California. "It was one of the very rainy seasons, and some of the bridges had washed out between Los Angeles and Monterey," he said.

Arriving at the Hotel Del Monte, now the headquarters for NPS-Monterey, the Sheingolds were greeted by the faculty and spouses who had

arrived ahead of them. "It was not like coming to a strange place. This was a family move," he said, "a school family moving out en masse." According to Sheingold, the group identity has maintained itself over the years and "to some extent, it's still here today among those who made the move."

They would later be joined by Orval and Frances Polk, whose daughter Dorothy recalled leaving Annapolis in the middle of a snow storm and finding warm sunshine for their Monterey arrival.

Dorothy's mother, who was president of the Staff Wives Club, helped everyone prepare for the trip by adapting the song, "California, Here I Come." The lyrics for her version entitled, "California, Here We Come!" typify the adventurous team spirit of all those who made the move:

California, here we come
With the school we're moving from.
We're driving, we're flying
We'll have some fun.
We're packing, farewelling,
Headed for our future dwelling.
New home, new friends, that's our fate.
That's why we can hardly wait.
Open up that Golden Gate
California, here we come!

Polk, who was a high school junior, said the Monterey community was very supportive of the Navy families. She recalled that her teachers and classmates at Monterey High assisted in the mid-year school transition for the children of NPS personnel. "Immediately, we were involved in all kinds of activities. Sandy Wright was elected Homecoming Queen at Monterey High the next year. I became assistant editor of *The Galleon*, the school paper.

"The biggest difference seemed to be that we newcomers wore our bobby socks up and the Monterey High kids wore theirs rolled down around their ankles," she said. "I remember being told that one teacher even mentioned it in class, saying that those of us who continued wearing our socks up were good examples of independent thinking, not following along with the crowd."

Polk also discovered that "it was wonderful being able to walk outside to various buildings while changing classes instead of having everything contained in one huge brick building."

Sheingold, a distinguished professor emeritus and active board member of the NPS Foundation, said that his children also liked Monterey. As for his wife, Sylvia, Sheingold chuckled: "The first time we drove down Ocean Avenue in Carmel, she turned to me and said, 'I'm going to like it here.'"

Despite a lack of earmarked Congressional funding to pay for it, Rear Adm. Ernest E. Herrmann (left) boldly announced in October of 1951 that the Naval Postgraduate School's move was definitely on.

Left: NPS Superintendent Rear Adm. Herman Spanagel with his wife Frances at the opening of the campus hall bearing his name.

Above: Gathered for the dedication of new academic buildings in 1956 are (left to right): former Chief of Naval Operations Fleet Adm. Chester Nimitz, Academic Dean Roy S. Glasgow, Rear Adm. Joseph R. Redmond and Rear Adm. Earl E. Stone.

Fifty Years and Counting

By Rob Bourke

Like the forty-niners a century before them, 500 NPS families, faculty, staff and students acted as pioneers, setting out from the East Coast to resettle in California late in 1951. It was an unprecedented alchemy, the migration of an entire institution of higher learning from one coast to the other.

Among the pioneers was a young aeronautics student named Donald "Red" Layton, who was traveling with his wife and three young children. Although Layton had reported to NPS in Annapolis only six months earlier, this cross-country trek would mark the beginning of what would become a fifty-year relationship with the school that continues to this day. When asked if he would like to be interviewed for *Alumni@NPS*, he quickly fired back, "I'd love to talk! How about tomorrow, ten o'clock?"

Layton first became aware of NPS as a Naval Academy Midshipman during World War II. "In fact, quite aware," said Layton, "because it was on the campus at the far end, near the baseball diamond." The proximity of the School motivated young midshipmen to excel. "Seeing those people and having the idea that one day I'm going to come back and go to the Postgraduate School had quite an effect."

That effect proved to be substantial, for in 1951, six years after graduating from the Academy, Layton returned to Annapolis, reporting to the Naval Postgraduate School to work on a master's degree in aeronautics. NPS's single, crowded building in post-War Annapolis, called Halligan Hall long before another NPS building in Monterey would bear the same name, was filled with anticipation for the not yet funded institutional move to Monterey. "The school normally started in the first part of September, but that year they started in the middle of June because of the possibility they may move the school. We waited anxiously for Congress to pass the money to buy the hotel."

Finally, word came. "The Admiral, Superintendent Herrmann, had a meeting for all the students and wives in the auditorium. He came down in front of the stage wearing a plaid shirt, looking very casual, and talked about the move. They closed the school on Thanksgiving and sent us on four weeks of field trips on the East Coast. Then we had some leave and travel, reported into Monterey in January, and went on another four weeks of field trips. This gave them time to get the equipment out and get the school ready." And so the journey began.

"My field trip group ended up at the Naval Test Center, Patuxent River, Maryland on the day before Christmas. I arrived back in Annapolis on Christmas Eve. The packers had been to our house, but the moving van had not yet arrived. We wanted to spend Christmas with my family in Ohio. So, we left a note for the movers and set out for an all night drive. 'We' included my wife, three daughters -- ages 28 months, 16 months, and two months -- and a luggage trailer.

"We had a four-door sedan, a Studebaker. I built a rack on top, which stuck up about three feet above the top, and I covered it with blimp cloth from an old wrecked blimp, so it would be waterproof. It was snowing as we drove across the Pennsylvania Turnpike. Whenever we stopped for gas we would slip and skid on ice at the stations. Twice we had to be pushed ahead in the gas line by a car full of soldiers behind us. After we had exited the turnpike near Pittsburgh, we ran out of gas. A mile ahead was a store with a gas pump, but since it was five o'clock on Christmas morning, it was closed. The owners lived over the store and, somewhat reluctantly, they came down to give us some gas.

"We arrived at my family home in Wooster, Ohio in time for almost a full day of Christmas with my family. The day after, we continued our journey to the West Coast. We wanted to be in the house that we had purchased, sight unseen, before I had to go on the second field trip."

Layton laughed merrily, "The trip across country was about as uneventful as it could be, considering that we were traveling with three infants.

Fifty Years and Counting

training in 1948, Naval Air Station Lakehurst was steeped in the history of lighter-than-air aviation. The base was established in 1921 as the Navy's first lighter-than-air base. In 1937, Lakehurst was the scene of the disastrous Hindenburg fire. The era of rigid airships ended in the conflagration, but their heritage continued. "There were still a lot of the old rigid airship people around. The leading chief on the air station had been aboard the Shenandoah when it crashed on the third of September 1925."

While at Lakehurst, Lt. Kathleen Gingras, a Navy nurse, caught the young ensign's eye. They were engaged on the fourth of July and were married on the third of September 1948 -- exactly 23 years after the Shenandoah crash. "The wedding was in the Shenandoah Memorial Chapel at Lakehurst. It was a real lighter-than-air wedding," Layton laughed. "Capt. Watson, the Commanding Officer of the station, gave the bride away. He had been the Public Relations Officer when the Hindenburg burned."

Although the tragic legacy of the rigid airships seemed to surround the wedding, their marriage is as strong today as it was in 1948. Smiling fondly, Layton remembered, "My wife was two ranks senior to me. I pointed out to her, in the Navy regs it says in the case of a riot, the senior line officer takes precedence. She was a staff officer and I was a line officer." Layton grinned knowingly, "We've now been married almost 53 years and we haven't had a riot yet, but if we ever do, I'm in charge. I'm still waiting for that moment."

The Navy blimps were flown as an Anti Submarine Warfare (ASW) platform against diesel-electric boats in the 50s. "You flew, normally, with a crew of three to four officers, and

continued on page 19

gas."

In addition to their own adventure, Layton recalls the adventures of many others during the migration to Monterey. One classmate, Mike Miller, went to his home in Minnesota for Christmas. After the holiday, he sent his wife and child to Monterey independently, and drove his car to their new home solo, loaded with a full side of beef, wrapped and frozen. To keep the meat frozen, he made the wintery drive across the high plains and over the mountains with the windows down. "He wore a parka with earmuffs and fur mittens," said Layton. "Once he reached Donner Pass, it was a race to arrive in Monterey before the meat thawed." Although it was close, Layton said Miller got the beef to a freezer in Monterey in time.

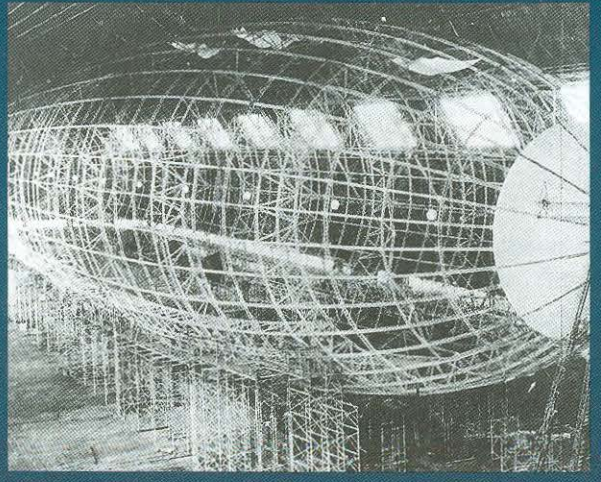
Following the long cross-country trek, the families settled into their new homes and new lives. "We moved into what would become Del Rey Oaks. I had bought a 3-bedroom house on a foundation, and paid $11,600 for it. I could see the bay from the house, over the roof of the house next door. That house next door I saw in the paper about six months ago for $480,000!"

To make their new residence feel more like home, the Laytons had a lawn installed before they arrived, but to their chagrin, "It rained heavily that first January and February. I spent a lot of time shoveling the lawn back up onto the yard!"

Yard work aside, the fledgling neighborhood was becoming a pleasant Navy community. "It was fun! We had a big social life, even with all the studies going on. The women had clubs. The men had clubs. We had section parties. We had progressive dinners."

A popular gathering place was the first floor dining room at NPS, then called the Bali Room for the Balinese décor it featured. "The Bali Room had a band (swing and jazz) two or three nights a week. I'd finish studying about nine o'clock, and I'd ask my wife if she would like to go down to the school and dance. It was a nice life," he said with a smile.

Classes resumed in 1952. Parking, a perennial challenge, was by carpool permit. "I carpooled with four people in my section that lived on Rosita



The USS Akron, shown during its construction in 1932, was one of the Navy's first airships.

This photo was taken during Red Layton's (pictured lowest) West Coast field trip in early January 1952, just before NPS classes resumed at the new site in Monterey. Layton's group is posed with the Convair XP3Y at the factory in San Diego.

The officers pictured are (in ascending order) Red Layton, Bob Barnes, George Hughey, John Carl, Dick Quiel, Mike Mulligan, Ted Longquest, Gordon McCormick, and Bob MacClelland. The two civilians are unidentified, presumably employees of Convair.

We only ran out of gas one and a half more times! The half time came when we were trying to reach the Boulder Dam. My wife was driving. We were very low on gas and I was coaching her, 'Let it coast down the hill. Then, just before the bottom of the hill, give it some gas so you don't lose the speed.' Finally we came over the last hill; we saw the dam but no filling station. We went across the dam to a construction site where a worker gave us a gallon of gas to get into Boulder City."

Layton's frequent problems with running out of fuel were perplexing. After some deliberation, he figured out that the problem was the roof rack. "I had no idea about the extra drag that it would put on the car -- I hadn't had that course yet in school! That's why we kept running out of

Ensign Donald "Red" Layton was commissioned in the closing months of the War and ordered to a minesweeper. "Minesweepers were the hooligan Navy. They were primarily commanded by reserves, who all got out of the Navy (at the end of the war) so there was an opportunity for brand new ensigns to command." He chuckled wryly, "You learned a lot of things on the job training." The experience of command as an ensign was valuable, but ships at sea were not Layton's ultimate goal. His interests took to the sky.

The golden age of airships came in the 1930s, when Layton was a boy. Lighter-than-air dirigibles ferried passengers over the Atlantic, and the Navy built two colossal rigid airships, the USS Akron and USS Macon, to carry scout planes. At 785 feet in length and 132 feet high, the Navy's airships were almost as long as three football fields and as high as a 10-story building.

"I was born in a suburb of Akron," recalled Layton. "My dad took me to see them building the Akron and the Macon. I grew up in a little town of 1,000 people and all we had were some two-story buildings, I just hadn't seen anything that big! When I saw them, they were still in the framework condition; they hadn't put the fabric on them yet. It was impressive. I thought I'd like to fly those some day, so airships were always on my mind."

In the post-war period, officers were required to complete two years of sea duty before basic flight training, at Pensacola, Fla. for heavier-than-air and Lakehurst, N.J. for lighter-than-air. "When I got close to two years, I put in applications to both. There was an opening in Lakehurst when I was available for orders."

By the time Layton arrived for

continued on page 10

Road," recalled Layton. "There was no freeway then, and the entrance road went straight into the school from the Del Monte Chapel."

The new home of NPS, the historic Hotel Del Monte, contrasted to the difficult conditions in Annapolis. "It was awesome, the grounds were spectacular." However, until the academic quad buildings were completed in 1954, the classrooms, labs, and offices were nearly as cramped as they had been in Halligan Hall on the Naval Academy grounds.

Layton's aeronautics classes were mainly held in the east wing of the former hotel. The chemistry lab was on the first deck, in the corridor. The aeronautics professors were on the fifth deck, usually one or two faculty to a room. "Their filing cabinets were out in the hall because they couldn't fit them under the sloped ceilings."

Space was tight, but for Layton the classes were memorable, and relevant to his Navy career. "One of the most interesting courses I've ever had in my life was a plastics course with Prof. Kinney. We learned to identify plastics by feel, touch, taste and smell. The final exam was to identify some plastics... for instance Teflon, when it burns it smells like geraniums. Years later, I was flying a seaplane and we had smoke in the back. It smelled like geraniums, so I asked 'What's Teflon here?' The rigger said that the pulleys on the control systems were. It turned out that one of them had jammed and was burning."

Layton finished at NPS in June of 1953, but his master's degree program continued for a third year through an NPS program at Princeton. He laughed, "It was much less disciplined there, much less stress. There were six of us from NPS (at Princeton) and we were so far ahead they eventually pulled us out and put us in a more advanced program."

After finishing his master's degree, Layton was thrust back into the operational world of maritime patrol flying. However, in the late 50s, the Navy's blimp program was waning. "I could see there was no future in airships, so I got into seaplanes. But they disappeared almost as fast," he said with the irony showing in his expressive face. "I flew Martin P-5Ms (seaplanes) out of Norfolk for only few years in ASW, then I had to retrain to fly P-2 Neptunes. They were a land-based patrol airplane with two reciprocating engines and two jets. I was moving up fast in the world."

"One of the most interesting courses I've ever had in my life was a plastics course with Professor Kinney. We learned to identify plastics by feel, touch, taste and smell."

Layton's next tour was a staff position at the Naval Aviation Safety Center for three years as the head of engineering. At that time, NPS was looking for a military instructor to set up a flight program, someone with a graduate degree and excellent safety experience. When Layton saw this, he seized the opportunity, moving out to Monterey for a second time in 1965. The Navy's Aviation Safety School came to NPS in 1967, for which Layton was a perfect fit, but he was enjoying his teaching experience. "I was offered a job as head of the school, but I still wanted to teach in aero." He did both.

In 1968, Layton retired from the Navy at the rank of Commander and became one of the first former military instructors to be kept on as a civilian faculty member. NPS became a second full twenty-year career for the new professor.

In 1974, Layton participated in the organization of a watershed conference on airships at NPS. "The last Navy blimp flew in '62 and there hadn't been a conference in years. We expected 50 or 60 people to show up. More than 300 people were still there on the final Friday afternoon!" The conference led to a resurgence in lighter-than-air aviation. "There are now 38 companies around the world building airships."

Layton said the most satisfactory part of teaching at NPS is the students. One of his first students "was a fellow named Kelly, who ended up with four stars and became Commander in Chief of the Pacific Fleet." Layton instructed four students who later became astronauts. The most recent was Army Lt. Col. Jeff Williams, who made a successful space walk in 1999.

Research took Layton from flying airships and fixed-wing aircraft to an interest in helicopters. After years of work designing rotary-wing aircraft, he qualified to fly helicopters at the age of 63. During his career as an NPS faculty member, Layton was also a guest lecturer and an instructor pilot for courses at the South African National Test Pilot School, and taught at the National Test Pilot School in Mojave, Ca. In his career as a professor, he wrote nine textbooks ranging in topics from system safety to helicopter design.

Golden A

Fifty years of graduate education in Operations Res

by Professor David Schrady

The year 2001 marks the 50th anniversary of the graduate education program in operations research at NPS. Professor David Schrady, presently a Distinguished Professor in the Department of Operations Research and past Chair of the department and former Provost of the institution, discusses the evolution of NPS and operations research.

It was no accident that the Naval Postgraduate School should have begun its operations research program so early in the history of the discipline. The U.S. Navy established the first formal operations research organization in this country in the spring of 1942 and relied on operations research throughout World War II. In 1950, the Chief of Naval Operations directed that a program of study in operations research be created. The program began in August of 1951 with a class of nine students, and the first degrees were awarded in January of 1953. The curriculum has been offered continuously since its initiation. There are now more than 3,300 alumni of the program, representing all of the U.S. military services and those of 31 other nations.

Beginnings

Operations research has its origins in the study of military operations. The British, specifically the Operational Research Society, mark the year 1937 as the birth of operational research (they say operational, we say operations). Operational research began when, having developed radar, scientists were asked to develop procedures for its use in a new, effective air defense system. This was a significant new employment of the scientific method and scientific personnel doing research to improve operations. When war came, this innovation of tasking scientists to study operational military problems was extended to other areas of military operations.

These developments were watched on this side of the Atlantic by both the Navy and the Army Air Corps. In April 1942, after the United States entered the war, the U.S. Navy established the Antisubmarine Warfare Operations Research Group (ASWORG) under the leadership of Dr. Philip Morse, professor of physics and director of the Sound Project at MIT. ASWORG became the first formal operations research organization in this country. The group developed tactics used in searching for submarines, devised plans for escorting convoys of ships, recommended the best depth setting for depth charges used against submarines, and contributed significantly to the ebb and flow of ASW measures and countermeasures. As the war drew to a close, the Atlantic submarine threat declined. In October 1944, after expanding its studies to include strategic mining, anti-air warfare and other areas of naval warfare, ASWORG was renamed the Operations Research Group (ORG).

The Navy realized the application of operations research in World War II was quite valuable. The Chief of Naval Operations (CNO), Fleet Admiral Ernest J. King, wrote in his final report to the Secretary of the Navy regarding the U.S. Navy in World War II, that operations research "made it possible to work out improvements in tactics which

nniversary

earch at NPS produces over 3,000 alumni worldwide.

sometimes increased the effectiveness of weapons by factors of three or five." Admiral King noted that the ORG would be renamed the Operations Evaluation Group (OEG) as more closely descriptive of its functions, and that he would ensure its uninterrupted continuation into peacetime.

In 1950, the CNO directed that an education program in operations research be established for naval officers. Rear Admiral E. E. Hermann, then NPS Superintendent, was instructed to set up a one-year curriculum in operations research at an appropriate civilian institution; MIT was suggested. Hermann queried several civilian universities without finding any interest. In December 1950, he and the Director of the OEG, Dr. Jacinto Steinhardt, submitted a joint proposal to establish a six-term degree curriculum at NPS. Steinhardt, who had joined ASWORG in November 1942, helped design the initial curriculum.

After considerable discussion, the Chief of Naval Personnel approved the proposal with the stipulation that the curriculum might require change if it proved to be too difficult for naval officers who had not specialized in higher mathematics. The first class of nine officers began their studies in August of 1951.

> The Chief of Naval Operations (CNO), Fleet Admiral Ernest J. King, wrote in his final report to the Secretary of the Navy regarding the U.S. Navy in World War II, that operations research "made it possible to work out improvements in tactics which sometimes increased the effectiveness of weapons by factors of three or five."

The new curriculum was built on mathematics and the physical sciences, and emphasized the techniques that had been used successfully in wartime operations research. Professors W. Peyton Cunningham from the physics department and Charles Torrence from the mathematics department directed the curriculum. The only open literature available was Morse and Kimball's *Methods of Operations Research*, published in 1950 as the unclassified version of their 1946 classified OEG report of the same title. Uniquely because the curriculum was at NPS, the classified reports of the OEG and other sources were also available and used in the program of instruction.

The first class graduated in January 1953. Experience gained with the first class led the Superintendent to a revised curriculum of eight terms. The expanded curriculum incorporated an experience tour at a functioning operations research group, greater coverage of operations research methods and work on digital computers. (An NCR 102A arrived at the School for use in instruction in 1954, and in 1961, the School received the first CDC 1604 machine produced).

The experience tour is a six-week period that occurs at roughly the midpoint of the curriculum. Students go off campus to an organization that does analysis to gain practical experience and insight in their thesis research subject. Both the experience tour and the thesis

are curriculum requirements to this day. While the degree has always been in operations research, the original name of the curriculum was operations analysis.

Growth of Operations Research

The journal *Operational Research Quarterly* first appeared in the United Kingdom in 1950. The Operations Research Group at Case Institute of Technology was created in 1952 and a two-week short course on operations research was given there in June 1952. The Operations Research Society of America was founded in 1952 and the first issue of the *Journal of the Operations Research Society of America* appeared in November of that year. The Institute of Management Sciences was founded in 1953 and its journal, *Management Science*, first appeared in 1954. Professor Morse set up the Operations Research Center at MIT in 1955. Also in 1955, MIT and Johns Hopkins University gave their first degrees in operations research and Case Institute of Technology followed in 1957. Many regard *Introduction to Operations Research* by Churchman, Ackoff and Arnoff to be the first textbook in operations research. It appeared in 1957, six years after the start of the NPS program.

As the field of operations research developed, so did the curriculum at NPS. Through the years, the curriculum has benefited from the input of both graduates and sponsors. The program has always enjoyed a close coupling with its clients, sponsors, and alumni. Applications were, and still are, emphasized to ensure relevance and bridge the gap between theory and the real world.

Throughout the 1950s an interdisciplinary committee of physics and mathematics faculty administered the curriculum. Linear programming, inventory control, queueing theory and wargaming were added to course work in probability and statistics, search theory, underwater acoustics and electromagnetic radiation. The focus was on the development and evaluation of tactics and systems. Many of the theses written were classified.

By 1960 it was apparent that operations research was growing in importance and that a new organization was needed for the faculty teaching the curriculum. The department of operations research was created in 1961 with Dr. Tom Oberbeck from the mathematics department as its first chairman. Dr. Jack Borsting, also from the mathematics department, succeeded Oberbeck in the summer of 1964. Under Dr. Borsting, the department grew to 47 faculty members by the end of its first decade, in response to the rapid growth in the number of students. In the summer of 1965, Dr. Robert F. Rinehart, from the mathematics department at Case Institute of Technology, became the Provost of the Naval Postgraduate School. Dr. Rinehart had been one of the pioneer operations researchers as a member of the ASWORG.

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With the arrival of Robert McNamara and the "Whiz Kids" to the Department of Defense in 1961, systems analysis became a centerpiece of defense decision-making. Systems analysis combined quantitative analysis and economic analysis while attempting to determine the cost effectiveness of defense programs. Both the operations research department at NPS and the Navy acknowledged this paradigm shift. Economists were hired and economics/systems analysis courses displaced many of the physics courses that were still in the curriculum. The name of the curriculum was changed to operations research/systems analysis.

During this period, the Navy was unsuccessful in many of its arguments with Secretary of Defense and reevaluated its decision-making process. One result was the 1966 establishment of the Systems Analysis Division of the Office of the Chief of Naval Operations. The divisions first head was Rear Adm. Elmo Zumwalt

(later Chief of Naval Operations, 1970-1974). The Systems Analysis Division (today the Assessment Division) became the sponsor of the curriculum at the Postgraduate School, an arrangement that remains in place.

Initially, the NPS student body was composed entirely of naval officers. In its second decade of operation, the curriculum was opened to Army, Marine Corps, Air Force, Coast Guard and international officers. In the late 1960s, the Army sent large numbers of officers to the program and it became their primary source of educated analysts. While over the years 99 percent of NPS students have been enrolled in the masters degree program, a doctoral program was authorized in 1971. To date the Department has graduated 28 Navy, Army, Air Force and international officers with a doctorate in operations research.

In the late 1970s, then CNO Admiral Thomas Hayward reemphasized tactical competency -- this led to renewed interest in tactical analysis. The curriculum again adapted to its clients' interests. Systems analysis content was reduced to reemphasize tactical analysis. It was a rebalancing of the original emphasis on tactical analysis and the mid-1960s emphasis on systems analysis. The curriculum name was changed back to its original name, operations analysis. A second curriculum leading to the

> Today, operations research is used widely across the depth and breadth of the U.S. Navy and the other military services and defense agencies.

(Top) Professor David Schrady (left) meets with Adm. P. D. Miller. Schrady is a past president of the Operations Research Society of America and of the Military Operations Research Society.

(Left) Lt. Harry Nicholson operates one of the first CDC units ever produced.

Golden Anniversary

Flag Officer Graduates from the Operations Research Curricula

1953*	RADM Conrad Abhau
1961	RADM C. W. Rixey
1962	VADM Tom Hughes
	RADM Robert Ailes
1964	VADM Joe Metcalf
1965	VADM Dick Miller
1966	Secretary of the Air Force James G. Roche
	RADM Grant Sharp
	RADM Philip McNall
1967	RADM Guy Zeller
1968	MG Joe Stewart, USMC
1969	VADM Bob Spane
	LTG John Yeosock
	VADM Ozden Ornek, Turkish Navy
1971	VADM J. Scott Redd
	VADM Lee F. Gunn
	LTG Tom Carney
	RADM James B. Hinkle
	MG Steve Silvasy
1972	ADM Richard C. Macke
	LTG Robert Hammond
	VADM Bill Hancock
	VADM Jim Amerault
	RADM Bob Nutwell
	BG George A. Fisher, Jr.
1973	RADM Bill Cobb
	RADM John Paddock, Jr.
	Chief Scientist, Ministry of Defence, Singapore, Lui, Pao Chien
1974	Secretary of the Army Thomas E. White
	ADM Mario J. F. Braga, Brazilian Navy
	ADM Chalin Sakornsin, Royal Thai Navy
1975	VADM Keith Lippert
1976	LTG David Heebner
	RADM Ron Route
1977	MG William S. (Scott) Wallace
1978	MG Robert F. Dees
1980	VADM Patricia Tracey
	RADM Michael Finley
1981	BG Ricardo Sanchez
1983	VADM Mike Mullen

master of science in operations research was created in 1986, operational logistics. The Deputy Chief of Naval Operations (Logistics), Vice Admiral Thomas Hughes, himself an NPS operations analysis alumnus, sponsored the new curriculum, which shares the core courses of the operations analysis curriculum.

Today, operations research is used widely across the depth and breadth of the U.S. Navy and the other military services and defense agencies. At the headquarters level, the Navy uses operations research in modeling and simulations, warfare capability assessments, requirements determinations, investment balancing, manpower modeling, recruiting, cost analysis and inventory management. In the Fleet, operations research is used in exercise reconstruction, battle experiments, campaign analysis, wargaming, strike planning, logistics support planning, readiness and tactical analysis.

Today, the Naval Postgraduate School curriculum involves courses in computation, probability, statistics, data analysis, optimization, stochastic processes and simulation, as well as military operations research courses such as combat modeling, search and detection, wargaming, joint campaign analysis and others. In addition to required course work, the program continues to include a six-week experience tour and a thesis.

Some of the theses written have resulted in the revision of tactics, initiation of the development of new systems, and the documented savings of tens of millions of dollars. The impact of these officers in the quantitative analyses, decision-making and leadership of their military services has been remarkable.

Based on an article by the same author first published in ORMS Today, February 2001.

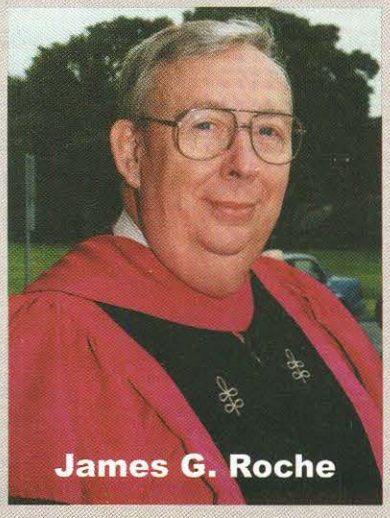
Remarkable indeed. Through June 2001, there are 3,388 alumni of the graduate education programs in operations research at the Naval Postgraduate School: 1,940 U.S. Navy officers, 589 U.S. Army officers, 308 U.S. Marine Corps officers, 38 U.S. Coast Guard officers, 23 Department of Defense civilians, 9 U.S. Air Force officers and 481 officers of the armed services of 31 other nations.

Bush Names Two NPS Operations Research Graduates as Service Secretaries

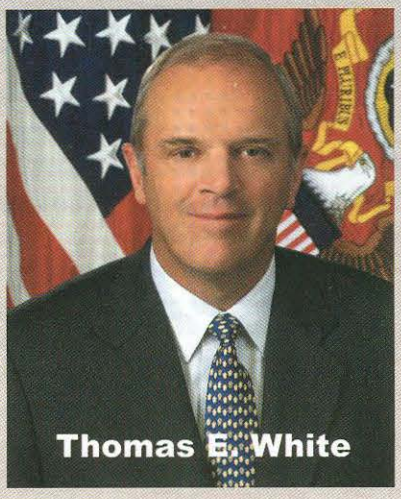
When Lt. James G. Roche approached operations research chair Dr. Jack Borsting in 1964 for permission to take a degree in his curriculum, Borsting could not have known he was speaking with a future Secretary of the Air Force. However, by the time Roche had graduated in 1966, Borsting was impressed with his student. "He was one of the best and brightest students I've had over the years. Jim was hardworking and had a great deal of integrity," said Borsting of Roche, who graduated with distinction at the top of his OR class.

After graduating, Roche was the operations officer on a destroyer in Vietnam. He applied the game theory he had learned in Monterey to fighting PT boats in the Tonkin Gulf. Roche completed a successful 23-year Navy career at the rank of Captain. In 1984 he began a new, and equally successful, career in business with Northrop Grumman.

Although successful in directly applying theory in combat, Roche said, "An officer should be a well-educated person. You don't have to justify education for what it does in an officer's next tour, the benefits come over time."


James G. Roche

Another distinguished graduate of NPS Operations Research agrees. "We must expand and develop educational opportunities," said Secretary of the Army Thomas E. White, a 1974 NPS alumnus, during his Senate confirmation. Education promotes "the continuous personal and professional learning required to take maximum advantage of technological advances," added the Army veteran.

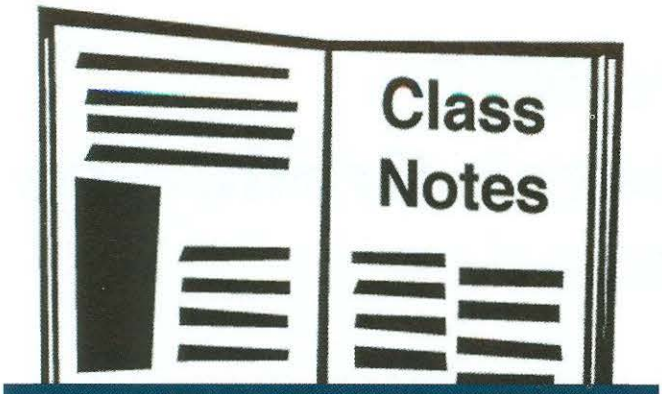

Thomas E. White

White's career after NPS catapulted him through the ranks to eventually serve as executive assistant to then Chairman of the Joint Chiefs of Staff, General Colon Powell. White retired after 23 years of active military service as a Brigadier General.

In 1990 he became a senior executive with Enron, where he eventually would become Vice-Chairman of Enron Energy Services, before being tapped by President Bush as the Army's top civilian leader.

Both White's and Roche's experience as military leaders and as civilian business executives, aligns them with the administration's focus on transformation of the military. "We must advance the development of bold and innovative leaders," said White. "There is no more important investment than our investment in people."

Roche echoes the idea. "The notion of thinking, the intellectual component of the military profession, is one that has to be honed. That was a long-term reason that the Naval Postgraduate School was formed, and it is one that I think is applicable today, maybe even more so because now the rate of technology change is higher."



Got News? Send your update to the NPS Alumni Relations Office at alumni@nps.navy.mil or visit www.npsfoundation.org

Class of 1972

CAPT Paul E. Carlson, USNR (ret.) is now the Business Administrator for the First Presbyterian Church in Seattle.

Class of 1974

VADM Edward Moore, Jr., USN (ret.) retired from the Navy this past May, and is now directing a Navy group at Anteon. Moore, the nation's highest-ranking African-American naval officer until his retirement in May, has been appointed vice president of systems integration for the applied technology group at Anteon Corp., an information technology company based in Fairfax, Va.

He will be based in Anteon's office in San Diego and will direct the company's surface Navy programs, including the tactical data links, fleet support and surface warfare engineering programs. Moore, who began his Navy career as a seaman and retired as a vice admiral after 38 years of service, turned over his command of the Pacific Fleet's surface forces to VADM Timothy LaFleur in May. During Moore's career in the Navy, he also commanded the frigate USS Lewis B. Puller and the cruiser USS Cowpens.

Class of 1977

Secretary of Defense Donald H. Rumsfeld announced today that the President of the United States has nominated **Rear Admiral Keith W. Lippert**, Supply Corps, United States Navy for appointment to the grade of Vice Admiral with assignment as Director, Defense Logistics Agency (DLA) located at Fort Belvoir, Va. RADM Lippert is currently serving as 41st Chief of Supply Corps and Commander Naval Supply Systems Command (NAVSUP), headquartered in Mechanicsburg, Pa. RADM Lippert relieved Lieutenant General Henry T. Glisson at a ceremony at DLA Headquarters on July 20.

Class of 1979

CAPT Philip Briscoe VI, USN assumed duties as Commander, Naval Beach Group Two in Little Creek, Va.

CAPT Gary Quick, USN (ret.), in addition to graduating from the electronic systems engineering curriculum, is also a graduate of the Navy Test Pilot School, Patuxent River. After retiring in 1998, Quick has worked for Lockheed Martin, Program Manager for the AF Airborne Laser Program (ABL) sensor suite and now, the Navy Business Development senior manager at Lockheed in Orlando, Fl. He also has an MS from USC and, "As always, continue to be very proud and lucky to have had the great opportunity to attend NPS and receive such a quality education."

Class of 1987

CDR Joanne N. Sexton, USN (ret.) has joined the faculty at Augusta State University in Augusta, GA. Her appointment is as an Assistant Professor of Computer Science.

Class of 1988

CDR Victoria M. Larson, USNR was named vice president in the Technology Department at Banknorth Group, Inc. She is a senior project manager for retail banking. Banknorth Group, Inc. is one of the country's 50 largest commercial banking companies with $18.2 billion in assets.

Class of 1990

CDR Scott Altman, USN, a two-time shuttle veteran including last Fall's STS-106 mission to the International Space Station, was named as Mission Commander of STS-109, the first flight of the space shuttle Columbia after a two year refit. STS-109 will be the third Hubble Space Telescope servicing mission, and launches in January of 2002.

Class of 1991

CAPT Dan Bursch, USN will be the first NPS grad to live aboard International Space Station Alpha. He is training as a member

of the fourth three-person station crew, and will launch aboard the space shuttle Endeavour late this year.

LCDR George M. LaVenture, USN (ret.) recently left his position as vice president & district manager of a North American Microsoft Solution Provider Partner, forming his own consulting company. "Our current Fortune 500 client base includes companies in the high tech and financial verticals," LaVenture said. The Boston, Mass. based Trinity Consulting Inc., can be found at www.Trinity-Inc.net.

Class of 1992

NOAA Captain Bob Maxson now serves as the Director, NOAA Aircraft Operation Center.

Class of 1993

After retiring in 1994, **LT Curtis Meisenheimer, USN (ret.)** is now an assistant professor of physics at Judson College and a physics instructor at Marion Military Institute. Judson College is a Baptist Women's College in Marion, Alabama, and MMI is a prep school and military junior college offering two-year Army ROTC commissions.

Class of 1994

LCDR Cynthia Womble, USN has been selected as an Associate Fellow for the next CNO Strategic Studies Group. Since receiving her degree in operations research, LCDR Womble has served as an analyst with the Navy's Operational Test and Evaluation Force (OPTEVFOR), then as XO, then CO, of MSC Rotterdam. She is currently studying at the Naval War College.

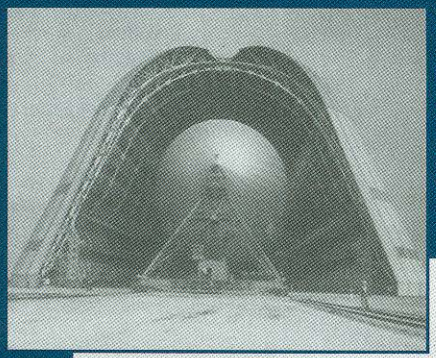
Class of 1998

LCDR Al Cuellar completed a successful tour as the supervisor of shipbuilding, Portsmouth, Va. and is currently serving as the FORCE Naval Engineer at Commander, Naval Air Force, U.S. Pacific Fleet.

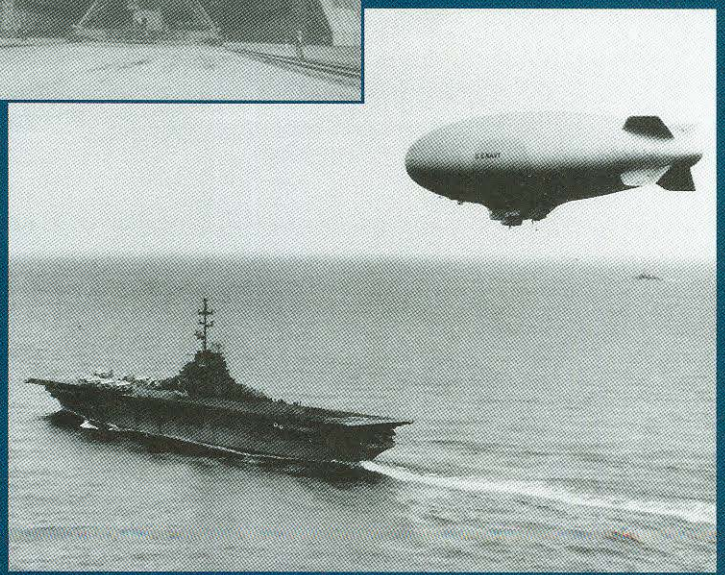
continued from page 10

four to six enlisted men."

The crew usually included at least an equipment operator, a mechanic and an ordnance man who doubled as a cook. "On a long patrol, we ate well!" A normal ASW patrol was 8-10 hours.



During that period, diesel-electric attack submarines would get as close as possible to their intended targets at snorkel depth, conserving their electric batteries for a clandestine escape after the attack. The blimps lifted powerful airborne surface search radars, which could detect diesel snorkels breaking the surface prior to the attack. Depth charges and rockets were available to prosecute a contact. Layton recalled that against the diesel boats, the airships were a potent weapon. "Then they came along with the nukes that could do 40 knots for 40 days and 40 nights submerged. If they didnt run away from you, they'd run you out of gas!"



Although the Navy's use of blimps all but ceased in the 50s, they are a true part of Naval history. One of the last blimps in operation was the ZPG-2 Airship, shown with USS Leyte during AISWIX-2 in 1958. Top, the USS Macon in a hangar at Lakehurst.

What's Inside

Golden Anniversary

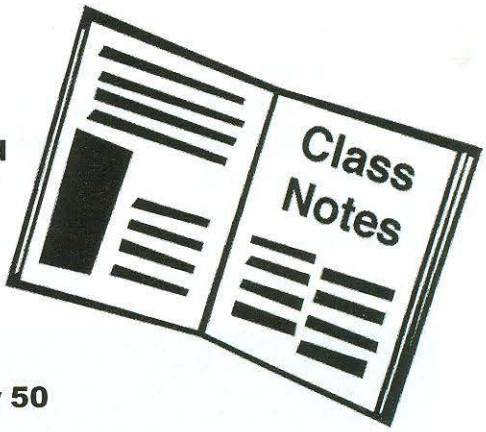
After 50 years of Operations Research at the Naval Postgraduate School, over 3,000 graduates have walked through King Hall auditorium to receive their diplomas. Read about the history of this unique NPS discipline as the program celebrates it golden anniversary.

From Annapolis to Monterey

The move was unprecedented. Never before had an institution so entrenched in education and research attempted to move all of its personnel, facilities, and students -- and to top it all off, the Naval Postgraduate School restarted its operations within a few short weeks. Read how your alma mater made the transition from Annapolis to Monterey.

Fifty Years and Counting

Red Layton has held on to a close relationship with NPS after moving with the school from Annapolis to Monterey. He shares his story of the eventful move now 50 years ago.



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